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ON SCOTTISH MARINE FISHERIES, 1898–1912.

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When the British Association last met in Dundee (1867) the scientific study of the marine fisheries was in abeyance, though considerable attention had been devoted to the life-history of the Salmon. It was sixteen or seventeen years later before a commencement was made with this important subject under the auspices of Lord Dalhousie, the Chairman of the Royal Commission on Trawling and the Fisheries. This Commission was appointed in response to urgent appeals in regard to the supposed decadence of the sea-fisheries in general. The subject has already been dealt with in its earlier aspects in a communication to the Edinburgh Meeting of the British Association in 1892,† in the "Resources of the Sea" in 1898, and in 1903 (a second decade) after the international scheme of work had been outlined.‡ Two lectures were also given at the Royal Institution in May, 1907.§ The object of the present communication is to carry the subject up to date, and to consider what conclusions may safely be drawn from a review of the whole question.

In the "Resources of the Sea" an abstract of the yearly

* Abstract communicated to the meeting of the British Association in Dundee, Sept. 5th, 1912.

† 'A Brief Sketch of the Scottish Fisheries, chiefly in their Scientific Aspects, during the Past Decade, 1882–1892.'

‡ 'A Second Decade in the Scotch Sea Fisheries, Dundee, 1903.'

§ 'Zoologist,' July, 1907.

captures by liners and by trawlers up to 1897 (inclusive) was entered, and, for the sake of the continuity, a similar abstract is given up to 1911, so that the yearly fluctuations may be observed and explanatory remarks made where necessary.

Line-caught round fishes (exclusive of Herrings) in 1898 amounted to a total of 926,257 cwts. = £398,912, a reduction of no less than 350,445 cwts. and £93,191 from the previous year. The Board attributed the decline partly to inclement weather and partly to deficient appliances. An increase of price, *viz.* 8*s.* 7*d.* as contrasted with 7*s.* 8*d.* in 1897, however, took place. There was a decrease in the case of Cod, as had occurred the previous year, yet 390,000 cwts. were taken, and only 287,000 cwts. of Haddocks. The decline in the Cod fishery was thought to be due to the failure in the district of the Moray Firth. There was a decrease also in Ling, Haddock, Whiting, and Conger, Saithe and Torsk alone showing increases.

Round fishes captured by the trawl had a weight of 661,000 cwts., valued at £322,780, or 9*s.* 9*d.* per cwt. as compared with 9*s.* 2*d.* in 1897. The increase on the previous year amounted to 161,741 cwts., and £93,274. An increase on the previous year in Cod, Ling, Saithe, Haddock, and Whiting occurred, but Conger presented a decrease. In the western districts the catch of Ling was greatly reduced.

The liners had a total of 111,554 cwts. of flat fishes, or 1403 cwts. less than last year, for which £66,543 were obtained, a sum less by £5525 than in 1897, but the price was lower, *viz.* 11*s.* 6*d.* instead of 12*s.* 9*d.* A serious decline took place in the quantity of Halibut taken by the liners.

Trawlers landed 84,275 cwts. of flat fishes, an increase over the previous year of 12,467 cwts., and the price obtained was £120,572, or nearly double that obtained from flat fishes by the liners. This is further brought out by the average price in each case, the liners receiving about 20*s.* per cwt., whilst the trawlers obtained 32*s.* 4*d.* Such is not, however, due to the inferiority of the catches of the former, but to the fact that the trawlers capture the most valuable kinds (Skate, for instance, being chiefly caught by the liners), and also obtain a better market.

The uncertainty of fishing operations was well illustrated in the case of the Scotch herring-boats which went to English

waters, where with ninety-four more boats a catch less by 36,646 crans resulted.

The grand total of all kinds of fishes (other than shell-fishes) landed in 1898 was 6,657,768 cwts., or an increase of 1,656,096 cwts. over the previous year, and of £252,112, a comparatively large increase, a considerable part of which was due to Herrings.

Fishing boats had decreased by 6 per cent., whilst trawl-vessels had increased by 86 per cent. The number of persons employed in the fisheries was 89,600, of whom 36,000 were fishermen, with 11,590 fishing vessels.

Of round fishes other than Herrings, the liners in 1899 caught 812,224 cwts., thus continuing the steady decline in quantity so noticeable for some years. For the catch they received £371,861, a sum less by £27,047 than in the former year.

The trawlers landed 816,410 cwts. of round fishes, of the value of £429,929, an increase over the previous year of 155,096 cwts., and of £107,149.

The liners captured 114,361 cwts. of flat fishes, an increase of 2807 cwts. over 1898, but with a value less by £2137.

The trawlers brought in nearly the same quantity as the liners, *viz.* 114,035 cwts., an increase over the previous year of 29,760 cwts. and £34,739.

The total quantity of all fishes landed was 5,145,076 cwts. = £2,189,933, or 1,512,692 cwts. less, and, strange to say, of £310,067 more in value than in 1898. The increase in value was partly due to the greatly enhanced value of the diminished catch of Herrings, the highest price ever obtained having been got for them. A single shot procured £300, and the average per boat ranged from £400 to £1300. The total catch of Herrings was 3,207,000 cwts. = £1,143,000.

The number of boats of all kinds was 11,190, of which 207 were steam trawlers. The number of persons employed in the fishing industry was 84,500, a smaller number than last year, and of these 35,700 were fishermen.

The round fishes captured by the liners in 1900 amounted to 650,005 cwts. = £304,837, a reduction on 1899 of 160,219 cwts. and £67,028.

Trawlers caught 891,975 cwts. of round fishes = £512,803, an increase of 75,565 cwts. and £92,874 over the previous year.

The flat fishes procured by the liners weighed 97,035 cwts. = £63,733, a diminution of 17,326 cwts., yet only of £673 in value. The increased captures of Halibut this year may have tended to increase the value.

The trawlers landed 129,550 cwts. of flat fishes = £167,569, an increase both in quantity and value compared with 1899. While Turbot and Lemon-dabs had decreased, Flounders, Plaice, and Brill had considerably increased.

The total quantity of all kinds of fishes landed was 5,369,265 cwts. = £2,325,994, a substantial increase on the previous year both in quantity and value. Of this total Herrings made up the large proportion, *viz.* 3,534,767 cwts. and a value of £1,251,394.

The number of boats was 11,275, an increase on the previous year, and of this number 232 were steam trawlers, and of fishermen 35,800, an increase under both heads.

This year (1901) also the disparity between the captures of liners and trawlers in regard to round fishes was marked. The liners landed 572,802 cwts. = £261,103, a considerable diminution both in weight and value compared with 1900.

The trawlers caught, of round fishes, 1,093,730 cwts. = £593,114, a large increase both in quantity and value in contrast with the previous year. Under this head 549,600 cwts. of Haddocks alone were landed at Aberdeen.

The liners increased their captures of flat fishes by 13,735 cwts. and £14,303, the totals being respectively 110,770 cwts. and £78,036.

The trawlers brought to shore 157,374 cwts. of flat fishes = £203,640, an increase over 1900 of 27,824 cwts. and £36,071. Line-caught flat fishes sold at 14*s.* 1*d.* per cwt., whilst the trawled produced 25*s.* 11*d.* per cwt.

The total quantity of fishes landed was 6,385,170 cwts. = £2,238,310, an increase over the previous year of 1,015,905 cwts., but the value was diminished by £87,674. This state of affairs was due to the low price of Herrings, the large catch of which, *viz.* 4,360,303 cwts., only brought 4*s.* 11*d.* instead of 7*s.* 1*d.* per cwt. the previous year.

The round fishes captured by the liners in 1902 amounted to 501,708 cwts. = £248,159, a reduction under both heads on the previous year. Though the total is less than in 1901, it is interesting that there was an increase in the capture of Haddocks—for the first time since 1896. The decrease in price was mainly due to the markets being flooded with an immense number of small Haddocks.

The trawlers brought to land 1,253,167 cwts. of round fishes = £602,290, an increase of 159,437 cwts. = £9,176, the comparatively small increase in price being due to the fact above mentioned.

97,247 cwts. of flat fishes were captured by the liners = £67,908, a reduction on the previous year, and the disparity in price (14*s.*) as compared with the trawlers (31*s.* 9*d.*) is noteworthy. The great success of the herring fishery may have contributed to the diminished catches of both round and flat fishes by the liners.

118,989 cwts. of flat fishes were landed by the trawlers = £118,719, a diminution compared with 1901 of 38,385 cwts. and £14,921.

The grand total of all kinds of fishes, exclusive of shellfishes, captured in 1902 was 6,866,028 cwts. = £2,502,668, an increase over 1901 of 480,858 cwts. and £264,358. Nearly three-fourths of this amount was due to Herrings, which also reached a higher price (5*s.* 9*d.*) than last year.

The liners in 1903 landed, of round fishes, 511,737 cwts. = £249,107, an increase of 10,029 cwts., but only of £948, on last year. The small increase in price was largely due to the immense number of small Haddocks landed at Aberdeen, which port accounted for 78 per cent. of the total catch of this fish.

Of round fishes, the trawlers caught 1,342,586 cwts. = £578,981, an increase of 89,419 cwts., but a diminution of £23,309, the latter being due to the low price obtained for Haddocks at Aberdeen.

Of flat fishes, the liners captured 82,059 cwts. = £64,591, a decrease of 15,188 cwts. and £3,317, the price having been 1*s.* 9*d.* more than in the previous year. Though there was an increase on the total landings of Flounders, Plaice, and Brill, the catch of the liners showed small decreases under both heads.

The trawlers landed 165,085 cwts. of flat fishes, the value of which was £232,053, about double the weight of those caught by the liners, and no less than three times the value, for whereas the liners only got an average of 15*s.* 9*d.* per cwt., the trawlers obtained 28*s.* 1*d.*, since they captured a larger quantity of the more esteemed species, besides having greater facilities for rapid distribution from their ports.

The total quantity of fishes landed in 1903 was 6,518,808 cwts., a result considerably exceeding the average of the previous ten years. It stands third (to 1898 and 1902) in quantity, and second to 1902 in value, which was £2,410,287, the price having been 7*s.* 5*d.* as against 7*s.* 3*d.* in 1902. This result was obtained by 11,008 vessels, of a tonnage of 140,531, valued at £3,448,168, a diminution of 2289 vessels, but an increase in value of £21,923. The steady decrease of sailing boats of the smaller size, their replacement by those of larger size and greater value, and an increase of vessels propelled by steam (nearly 300 per cent.) during the decade being the noteworthy features. However, there are still 10,572 sailing boats as against 436 steam vessels. There were 36,162 fishermen employed, *viz.* 75 more than in 1902. In regard to Herrings, whilst the catch during the decade has varied little, the value has risen year by year, so that a sum of £474,145 more was obtained in 1903, as contrasted with 1894, though the catch was 54,440 cwts. less.

A considerable increase occurred in 1904 in the quantity of round fishes caught by liners, *viz.* 628,898 cwts., or 117,161 cwts., and £30,321 more than in 1903. Instead of the continuous decline in the line-fishing of Cod, this year produced an improvement. Other round fishes such as the Ling also showed an increase, largely due to steam-liners in the Atlantic.

Trawlers landed 1,520,949 cwts. of round fishes, an increase of 178,363 cwts. over the previous year, and £39,706 more in value, though the average price was 7*d.* less per cwt.

The liners brought to land 120,211 cwts. of flat fishes, an increase of 38,152 cwts. and £16,112 over 1903, and this year the liners accounted for most of the general increase in weight and for the whole of the increased value, since the trawled flat fishes realized £11,837 less than in 1903. Halibut, which is chiefly caught by liners, showed a considerable increase. An

increase of £2800 in the value of the Flounders, Plaice, and Brill caught by the liners is also a noteworthy feature.

The weight of the fiat fishes caught by the trawlers was 180,709 cwts., and the value £221,212, an increase of 15,624 cwts., but a diminution of £10,841, the price having been 3*s.* 7*d.* per cwt. less than in 1903. Lemon-dabs are almost wholly captured by the trawlers, and while there was a slight increase in quantity, the value showed a decrease of 7 per cent. on 1903. Turbot, which had shown a gratifying return of 8955 cwts. and £32,081 in 1903, fell this year by 2000 cwts. and £8,739.

The total quantity of fishes landed in 1904 was 7,947,829 cwts., a record in the Fishery Board's returns, and exceeding by 1,081,801 cwts. that of 1902, hitherto the highest on record. The value, however, was not proportionate, for whereas the average per cwt. in 1902 was 7*s.* 3*d.*, it was only 5*s.* 7*d.* in 1904. The Board accounted for the diminution by the preponderance of Herrings which amounted to 5,488,456 cwts., the highest figure during the decade, yet the price was low, *viz.*, 3*s.* 9*d.*, the enormous total catch thus falling short of that of 1902 (the next highest) by £271,566. Such are the vicissitudes of the fishing industry. The white fishes formed a record, both in quantity and value.

Though there were ten trawlers less than in 1903, the returns of trawled fishes presented an increase of 139,600 cwts. Steam-liners, on the other hand, showed an increase during the decade of 350 per cent. in number, and 530 per cent. in value, a greater increase than that of the trawlers. The total number of persons employed in the fisheries was 86,621, an increase over 1903 of 2068. Of these, 31,984 manned the sailing-boats, 1639 the steam-liners and net-fishing craft, and 2637 were on board the trawlers.

The quantity of round fishes captured by the liners in 1905 amounted to 619,194 cwts. or 9704 cwts. and £4674 less than in 1904. Thus the tendency in the quantities captured by the liners to decline still continued, and were only 50 per cent. of what they were ten years ago. It is noteworthy also that stormy weather interfered with the catch of Haddocks by the liners, and that the decrease in quantity (27,530 cwts.) was accompanied by a diminution in value (£14,649) ; whilst the diminished captures

by the trawlers (70,440 cwts.) was followed by an increase in value (£47,100)—probably because the proportion of small fishes was less than usual. Line-fishing still maintained its superiority in regard to the capture of Ling.

The trawlers landed 1,563,247 cwts. of round fishes, the greatest amount both in weight and value (£729,822) during the decade. The whole of the increase in value was referable to the Aberdeen district. As an example of the changed circumstances, it may be noted that, whilst in 1898 the liners landed one and a half times the quantity of Whitings obtained by the trawlers, the latter now land five times the quantity procured by trawlers.

The flat fishes caught by the liners in 1905 amounted to 111,941 cwts. = £72,961, a decrease on the previous year of 9170 cwts. and £7742. The Board attributes the decrease partly to the stormy weather and to the greater facilities which trawlers have of despatching fresh fishes. Plaice caught jointly by liners and trawlers showed a decline from the preceding year of 10,230 cwts. and £9481, the failure of the line-fishing in Anstruther and Montrose districts being especially noteworthy in this respect. There are other causes, however, which the Board does not allude to, such as the absence in certain places of that whole-hearted energy which alone can give success in sea-fishing.

The trawlers caught 177,472 cwts. of flat fishes, a decrease on the previous year of 3237 cwts. and £4769. No fish has been so often brought forward as indicating the decline of the sea-fisheries as the Lemon-dab, which ere now, according to these views, should have been on the verge of extinction. Yet in the returns this fish, almost wholly caught by trawlers, stood at 30,850 cwts. = £55,379—an increase over the previous year of 15 and 11 per cent. respectively in weight and value. Turbot showed a decrease of 300 cwts. and £1900.

The total amount of fishes (exclusive of shell-fishes) was 7,856,310 cwts., a decrease on the record figures of the previous year of 91,519 cwts., but the value of the year's catch was the highest on record, *viz.* £2,649,148, and exceeded that of 1904 by £146,480. The Fishery Board looks on value as the "true test," and therefore rightly considers the result highly satisfactory. Much of this was due to the large catch of

Herrings, *viz.* 5,375,225 cwts. = £1,352,421, yet there was an increase both in quantity and value of white fishes. This total catch was obtained by 310 fewer vessels, and 102 fewer men on board.

In 1906 the liners caught 601,033 cwts. of round fishes, a decrease on 1905 of 18,161 cwts., but an increase in value of £7390. It is interesting that the line-catch of Haddocks brought nearly £17,000 more than in 1905. As bearing on the question of steady perseverance at a particular branch of fishing, it is noteworthy that the liners had a decrease of nearly 21,000 cwts. of Cod, and nearly £2000 as compared with 1905, the fishermen of the East Coast preferring to follow the Herring rather than the Cod. Thus the variable energy as well as the vicissitudes of weather have an influence on the captures of sea-fishes.

The trawlers captured 1,683,335 cwts. of round fishes, an increase of 20,089 cwts., but a decrease in value of £7142. Of Haddocks alone 100,000 cwts. more were caught than last year, but the value was £24,000 less. The Board states that the warm weather and the landing of large quantities of small Icelandic Haddocks reduced prices to an exceptionally low level. There was an increased catch and value of Cod.

Of flat fishes 46,431 cwts. were caught by the liners in 1906, the smallest catch in the decade. It is 64,610 cwts. less than in 1905, and so sudden a decrease shows that it is due to other causes than diminution of fishes. Whilst the reduction in quantity is thus great, it is satisfactory to find that the value was reduced only by £13,317, this being due to the enhanced price of 25*s.* 8*d.* instead of 13*s.* 2*d.* in 1905.

137,496 cwts. of flat fishes were landed by the trawlers, and though the amount was less by 39,976 cwts., the value was £3824 over that of the previous year, the price per cwt. having been 32*s.* instead of 24*s.* 1*d.*

The total catch of Plaice by liners and trawlers was 58,830 cwts., valued at £80,251, so that, contrary to the views of some, it is a fish of considerable importance in Scotland. The catch was 2581 cwts. and £3183 over that of the previous year. Lemon-dabs showed an increase of 6 per cent. in weight and 19 per cent. in value over 1905. Turbot still presented a diminution both in weight and value.

The grand total of all kinds of fishes (other than shell-fishes) landed in 1906 was 7,593,369 cwts., the third highest on record, but what is very satisfactory is that the value is the highest yet obtained, *viz.* £2,977,593, or £328,445 above any previous record. It cannot be said that these and other statistics bear out the lugubrious remarks which for many years have characterized a section of the community. This great total was largely made up of Herrings, *viz.* 5,016,220 cwts. = £1,661,178, the largest sum obtained within the decade, though the weight was less than that in the two previous years. 38,856 persons manned the fishing fleet, an increase of 2698 over 1905; and 92,305, including the former, were employed in the various industries subsidiary to the fisheries, an increase of 4104 in all. Such figures do not point to an unsatisfactory pursuit. There was a reduction of twenty-seven in the number of vessels, but an increase of 5696 in tonnage and £715,116 in value.

In 1907 the round fishes landed by liners weighed 529,962 cwts., and had a value of £262,817, a diminution on both heads as contrasted with 1906. The position of line-fishing is shown by the fact that in 1898 no less than 58 per cent. of the round fishes were captured by them, whereas in 1907 the quantity stood at 22 per cent. Less energy was given to this pursuit, and more to the Herring fishing. Ling, Haddocks, Cod, and Whitings all participated in the decrease, yet in Conger fishing, a pursuit of the liners, there was an increase of 2525 cwts. and £921 over 1906.

The trawlers caught 1,874,411 cwts. of round fishes, the largest catch on record up to date, and 191,076 cwts. over the large return of the previous year, and exceeding it in value by £32,169.

The liners produced 54,043 cwts. of flat fishes = £69,432, an increase over the previous year, yet only about half the quantity obtained in 1905. Whilst the liners thus improved on the previous year, the trawlers had diminished catches. Halibut, Plaice, and Flounders were those in which improved catches were obtained.

The quantity of flat fishes landed by trawlers amounted to 136,502 cwts. = £218,705 a slight diminution in both cases from 1906. The total quantity of Plaice (80 per cent. of which

was due to the trawlers) was 54,700 cwts. = £75,989; a decrease of over 4000 cwts. and £4200 as compared with 1906. On the other hand, Lemon-dabs did not vary much in quantity from the preceding year's figures, yet £3000 more was obtained. Turbot, again, showed increases of 755 cwts. and £2773.

The total amount of all fishes landed was the highest on record, being 9,078,059 cwts. of the value of £3,169,737. The Board truly says that this result shows a new record in the fishing industry in Scotland. It exceeds by 1,484,690 cwts. and £192,144 the highest figures hitherto attained. Yet the average price was lower by 10*d*. per cwt. than in 1906. This favourable condition was largely due to the fact that the catch of Herrings exceeded all former returns, though at one time the Herring was supposed to be a vanishing fish. The Herrings landed amounted to 6,381,117 cwts., and the value to £1,834,940. Yet there were 189 fewer vessels than in 1906, though there was an increase in tonnage to the extent of 2304 and of £680,968 in gross value; 32,228 men and boys, or 372 more than in 1906, manned the vessels. The greater number of vessels, 89 per cent., were sailing-boats, 8 per cent. were steam-driven vessels employed in Herring, drift, and long line-fishing, and 348, or 3 per cent., were trawlers.

In 1908 the liners captured 670,946 cwts. of round fishes, 140,984 cwts. more than in 1907, but as the value was lowered by 2*s*. per cwt. the total over last year was only £1457. Much of the improvement in the catch of the liners was due to steam-liners, yet in regard to Cod and Ling the sailing-vessels were pre-eminent. It is interesting that, taking the statistics of the East Coast for twenty years,* the average catch of Ling for the first ten years, 1889–1898, was 46,129 cwts., whilst for the last ten years, 1899–1908, the average was 105,648 cwts., or more than double. Of Torsk, a fish also taken largely by liners, the respective averages were 1981 cwts. and 7540 cwts., a still more noteworthy increase.

The trawlers caught 1,910,038 cwts. of round fishes, the highest on record, the same position being held by the value, *viz*. £756,569, though the average per cwt. (8*s*.) was the lowest

* 27th Ann. Rep. S. F. B., Part III., "Review of Statistics," by Dr. Fulton, p. 129.

in the decade. At Aberdeen the preponderance of small Haddocks was again noteworthy, *viz.* about 42 per cent. of the total catch. Cod, Ling, and Whitings all showed increased returns.

The returns of the flat fishes caught by the liners, *viz.* 71,072 cwts., also showed a substantial increase on the former year of 17,029 cwts. and £23,991. This improvement was due to the larger catches of Halibut (11,000 cwts. over 1907) landed at Aberdeen, chiefly by the steam-liners, greater attention having been devoted to this fishing owing to the low prices prevailing for Cod and Ling.

The trawlers landed 128,843 cwts. of flat fishes, or 7659 cwts. less than last year, and with a diminution in value of £15,204. There was a decrease in the total landings of Plaice of about 5300 cwts., referable entirely to trawlers, for the catch of the liners showed an improvement. The total value was £69,404, or £6586 less than the previous year. Lemon-dabs realized £1400 more than in 1907, and showed an increase of about 1200 cwts. The catch of Turbot showed a slight decrease, but the value was greater by nearly £1000. The average value of Turbot is about £3 10*s.* 4*d.* per cwt., while for Lemon-dabs it is £2 1*s.* per cwt., and for Halibut £1 14*s.* 2*d.* per cwt.

The total quantity of all kinds of fishes (exclusive of shellfishes) for 1908 was 8,645,252 cwts., or 372,901 cwts. less than in 1907, the record year, and the value less by £636,965. Though the year stood second in the amount of fishes landed, it was only fourth in value, for the average price was only 3*d.* more than the lowest (5*s.* 7*d.*, 1904) in the decade, and 2*s.* 10*d.* under that of 1907. Though the catch of Herrings was under that of 1907, it was the second highest on record, *viz.* 5,728,157 cwts., but its value was only £1,161,111, since the average price was about 4*s.* per cwt. instead of 5*s.* 9*d.* in 1907, and being below the average for the preceding ten years. The foregoing results were obtained under a decrease of 438 sailing-vessels, and an increase of 151 steam-vessels. During the ten years a diminution of 1498 vessels had occurred, but the value of these larger and better equipped vessels had increased by £3,193,765, a remarkable fact. The men employed on board had increased by 100 since last year; and during the ten years by 3328. In the same way the total number of persons employed in the fisheries and

subsidiary industries had increased by 2759 in the decade, and this year stood at 92,359.

In an interesting review of the statistics of twenty years in 1908,* the second decennial period, 1899–1908, showed an increase in the captures of the following fishes over the first decennial period, 1889–1898, on the East Coast, thus:—Cod, 48 per cent.; Ling, no less than 129 per cent.; Torsk, almost 281 per cent.; Saithe or Coal-fish, 85 per cent.; Haddock, 23 per cent.; Conger, 5 per cent.; Turbot, 41 per cent.; Halibut, 85 per cent.; Lemon-dab, 58 per cent. The total returns of Plaice are only given for the years 1904–1908, a steady decrease from 62,565 cwts. to 44,596 in 1908. As, however, the total captures of Plaice rose in 1909 to 58,977 cwts., in 1910 to 51,295 cwts., and in 1911 to 53,368 cwts., there is room for caution in deduction, since it is necessary to ascertain the amount of attention devoted to Plaice-fishing in the various areas. In the case of the Herring, the increase in the ten years ending in 1908 over the previous ten years was no less than 231 per cent., and yet anxiety about this fish was felt a hundred years ago, if not earlier.

Of round fishes other than Herrings the liners landed in 1909 667,432 cwts. = £248,609, a little less than in the previous year, or a decrease of 6·5 per cent., but the quantity taken by Cod-nets and other fixed nets was more than doubled in contrast with 1908. The catch of Whitings was considerably less than in the previous year, but the price, 12*s.* 4*d.* per cwt., was 5*s.* 2*d.* over that for trawled Whitings.

The trawlers caught 1,828,570 cwts. of round fishes = £735,471, a diminution of 81,468 cwts. and £21,098 compared with 1908.

The liners produced 66,568 cwts. of flat fishes = £86,152, a decrease of 4504 cwts. and £7271 on the previous year.

The trawlers landed 144,966 cwts. of flat fishes = £207,433, an increase of 16,123 cwts. and £3942, the price this year having been 3*s.* less than in 1908. Under this head it has to be noted that Lemon-dabs showed an increase of 6929 cwts. on the previous year, the total value being £74,627, a considerable sum for a fish that formerly was supposed to be steadily diminishing.

* *Op. cit.*, Dr. Fulton, Part III., p. 129.

Plaice had increased by 9564 cwts. and £4311 over 1908. Turbot showed a slight increase in quantity over the previous year, but a decrease in value.

The total quantity and value of all fishes (exclusive of shellfishes) landed in 1909 was 7,423,185 cwts. = £2,889,107, a diminution in weight of no less than 1,222,077 cwts. on 1908, but with the substantial increase in value of £376,945 over last year. Such are the continuous vicissitudes of the fisheries. Whilst the Herrings had diminished by no less than 1,148,817 cwts. under the catch of 1908, yet the advance in price made a balance in favour of 1909 of £418,099. This year also showed a diminution in the number of vessels, and a slight diminution of the persons employed.

An instance of the vast resources of the sea occurred at Kirkwall and Stromness Harbours, where immense shoals of young green Cod (Saithe) appeared, and upwards of 400 tons were captured and sold for manure at about 10*s*. per ton.

The liners in 1910 captured 712,099 cwts. of round fishes = £272,159, an increase of 44,667 cwts. and £23,520 on the previous year, the quantity and value of this class of fishes from all methods of fishing being the highest on record, a result to some extent of the great development of the Cod-net fishing, though the quantity taken by line increased by 5000 cwts. The total of Haddocks for the first time fell below Cod in quantity. Ling, Whiting, and Torsk caught by liners had increased on the previous year. This year also 14,000 cwts. of young green Cod were landed in Orkney, and 240 tons were sent to Aberdeen to be manufactured into fish-meal. The rest were sold locally for manure.

The trawlers landed 1,898,014 cwts. of round fishes = £875,478, the highest on record, surpassing that of the previous year by 69,444 cwts. and £140,007, the price obtained being 1*s*. 2*d*. above that of 1909. This year, notwithstanding previous doubts, Cod exceeded Haddocks in total weight, but vast numbers of small Haddocks appeared on various grounds, and were sold for manufacturing into fish-food for cattle.

The liners caught 64,847 cwts. of flat fishes = £95,178, a diminution of 1721 cwts., but an increase of £9026 in value compared with 1909. The liners were also fortunate in getting

an increased price on the former year, *viz.* 29*s.* 4*d.*, instead of 25*s.* 11*d.* per cwt.; 145,937 cwts. of flat fishes = £215,297 were landed by trawlers, an increase of 1001 cwts. and £7864 on 1909.

Taking both liners and trawlers together, it was found that Plaice showed a decline of 7682 cwts. and £2643, the Board supposing that Plaice were becoming scarcer on the regular trawling-grounds. Halibut fishing, on the other hand, was highly successful, for an increase of £12,368 occurred over that of the previous year. Lemon-dabs, a fish long held up by the advocates of the impoverishment of the sea, showed an increase of 3101 cwts. and £5766 on 1909. Turbot had a weight of 4987 cwts., and a value of £17,681, a diminution of 1359 cwts. and £3059 on the previous year.

The total quantity of all kinds of fishes (exclusive of shell-fishes) brought to shore in 1910 amounted to 8,709,655 cwts. = £3,100,387, an increase on the previous year of 1,286,470 cwts. and £211,280, the second highest result on record. Of this, 5,741,057 cwts. was attributable to Herrings, and the value of these was £1,609,048.

The total number of fishing-vessels was 9724, of which the liners and net-fishermen had 346 steam, 3563 sail and motor boats, and the trawlers 320 vessels; 38,941 fishermen manned the vessels, a considerable increase over the previous year.

The round fishes captured by the liners in 1911 weighed 755,122 cwts. = £285,087, an increase of 43,023 cwts. and of £12,928. This increase is in consonance with the record catch of the year. The liners captured 694,017 cwts. and the nets 61,105 cwts., the latter amount being no less than 47,798 cwts. below that of the previous year. The decrease is stated to be due to the failure of the spring Cod-fishing in the Moray Firth, but in other places it may also be caused by the lack of energy or the prevalence of bad weather. Dense shoals of young green Cod were again captured in Orkney. Torsk and Conger showed an increase.

Trawlers captured 1,938,274 cwts. of round fishes = £819,731, an increase in weight of 40,260 cwts., but a reduction in value of £55,747—a circumstance due to the large number of small Haddocks at Aberdeen, which, unfit for the market, were sold to

manure merchants. The occurrence of vast shoals of these, of Saithe, Cod, and other Ganoids, in the region north of the North Sea, is well known.

The capture of flat fishes by liners amounted to 71,917 cwts. = £110,495, an increase of 7070 cwts., and £15,317 on the previous year, the value indeed being a record one in the line and net industry. Plaice as caught by both liners and trawlers had improved on the previous year, and so with Halibut, but Lemon-dabs were slightly less, though the price was higher. Turbot fell short of 1910 by 482 cwts. and £2385.

Trawlers procured 138,261 cwts. of flat fishes = £207,390, a diminution on the previous year of 7676 cwts. and £7967. Plaice showed an increase of 2073 cwts. and £148, the latter sum being reduced by the greater proportion of small fishes. Long experience of a particular locality shows that no change had occurred on the average saleable size, and that inshore grounds frequented by young Plaice should be avoided. Turbot, which is largely caught by the Granton trawlers, probably because the Forth and St. Andrews Bay and the adjoining regions are best adapted for its increase, showed a decrease of 482 cwts.

The total catch of all kinds of fishes was 8,709, 655 cwts. = £2,978,000, a reduction on the previous year of 533,924 cwts. and £122,387. Thus from year to year fluctuations occur in the most varied manner, yet it cannot be said that there is any cause for anxiety. Of this total 5,120,632 cwts. were due to Herrings, a considerable decrease on the previous year. There was a decrease of 181 vessels, the total being 9543, of which 1486 were steam-vessels, 233 motor-vessels, and 7776 sailing-vessels. The total number of persons employed in the fisheries and various subsidiary industries was 89,153, and of these 38,626 manned the vessels, a decrease of 315 on the previous year.

Besides the foregoing statistics of captures, it is well to remember that a large number (1257) of Scottish fishing-boats land their catches in England and Ireland, the total catch, for instance, in 1910 being 1,397,026 cwts. and the value £498,539.

A thoughtful perusal of the foregoing statistics to the present

date confirms the propriety both of the caution exercised in recommending closures in 1884, and of the deductions made in 1898 in the 'Resources of the Sea,' in so far at least as the safety of the food-fishes is concerned. The larger fishes may to a large extent be swept from a given area by continuous fishing and the rest rendered more wary, but the pelagic eggs of the remaining adults and the swarms of young from the neighbourhood by-and-by fill the gaps.

The agitation alluded to in 1883 was mainly directed by liners against trawlers, and when the scientific report was issued early in 1885, dissatisfaction was felt at the result by the liners, who were largely influenced by various agitators. Yet after the lapse of twenty-eight years the main facts of that report stand, whilst the divergent views both of a section of the public and of some scientific men have been disproved by experience and by the various investigations which have since taken place, especially by the work of the 'Garland' in the closed areas of Aberdeen Bay, St. Andrews Bay, the Forth, and other areas. Still more have the opposite views lacked support from the work of the International Staff in the North Sea. Even those scientific men who attempted to prove the impoverishment of the sea have long been silent, whilst from decade to decade the Scotch Fishery Board's returns have corroborated the results of 1884. The attempt of the Board to prove, by comparing the first five years' work of the 'Garland' with the last five years, that the fishes had been diminished on the areas (from the effects of trawling outside the closed limits), failed both in its methods and results —notwithstanding all the ability and all the opportunities of its advocates. Even if the work of the 'Garland' had been ambiguous, subsequent experience would have shown the true position.

Within the experience of one life not a few of the important food-fishes have become the subject of gloomy forebodings to the fishing population and especially to those who for one reason or another have emphasized their opinions. The Herring, the Cod, the Haddock, the Plaice, the Lemon-dab, the Sole, and the Turbot, have each in turn occupied this position. Yet after all these years is any one of them on the road to extinction, or even to a serious diminution, when the respective efforts to capture

are taken into careful consideration? It is but a slender argument, for example, to point to the statistical diminution of the Plaice in a single rich bay within recent years—without taking cognisance of the fact that in the first brush of uninterrupted fishing, or in the first use of nets, the men used all their energies and every art to capture, whereas, recently, they follow less hardy and less strenuous pursuits—in addition to casual fishing. Some indeed hold that crofting and fishing are incompatible with success in either, and there may be a basis of truth in this view. At any rate, it is not reasonable to point to reduction in captures without an inquiry into the persistence of methods. Fishing needs all the time and all the energies of those fine hardy men in whom every one takes a deep interest; but successful fishing needs likewise freedom from pernicious agitation and the fomenting of class prejudices.

In connection with the supposed diminution, notice on the present occasion can only be taken of the Plaice, which for years has been a source of frequent complaint and solicitude. There is no doubt that a limited area by constant fishing may be denuded of many of its large Plaice, but this does not mean the serious diminution of the species, for it is so widely dispersed over the North Sea as to be most favourably placed for survival. The gaps made by the removal of the large forms are by-and-by filled by the smaller forms, which on almost every sandy beach swarm in vast multitudes. So long as this continues there is little danger for the Plaice. Besides, it is well to remember that Nature is able to supply the whole of the Common Eels of the western border of Europe and of the Mediterranean from eggs shed in the middle of the Atlantic, as Dr. Schmidt has so graphically told.* Compared with this remarkable condition, what difficulty is there in maintaining a species scattered all over the North Sea, and which also spawns so near our shores, and the eggs, larvæ, and young of which are in countless multitudes on every suitable site? Further, as if to emphasize the lesson, the vast destruction of young Soles which daily takes place by the shrimpers in the estuary of the Thames, and which has taken place for hundreds of years, has not extirpated the adults in that locality. There is, therefore, reason to believe that the

* *Vide* 'Nature,' August 22nd, 1912, and various Danish journals.

future of the Plaice is not without hope, and that the species will long continue to furnish the nations bordering on the North Sea with a valuable food.

On the subject of the artificial hatching of marine fishes little more can be said than in 1907,* though the scientific superintendent of the Scotch Fishery Board, Dr. Fulton, has since published the results of the transportation of larval Plaice to Loch Fyne (a long and narrow sheet of water) for a period of seven years, and contrasted the condition of the margin of the beach as regards young Plaice with the subsequent six years in which no larval Plaice were deposited in the loch. The fact that the captures of such young Plaice varied during the first seven years from 24 to 174 per hour, and in the second from 8 to 112, and, further, that the second highest capture occurred in the second period, when no larval Plaice were put in the loch, create a desire for further information as to methods, weather, and condition of the sea in the respective periods. The reporter of this experiment in Loch Fyne in 1908 did not give full weight to the wide distribution of the Plaice over the whole of the North Sea, and rested his argument for artificial hatching on the supposition that out of two or three millions of the ova of such a fish as the Cod "only two reproductive individuals survive." Further, in dealing with the great diminution of larval and post-larval forms as contrasted with pelagic eggs in the tow-nets, no account is taken of the activity of the larval and post-larval fishes which from a very early stage avoid to a greater or less extent instruments of capture. If demersal fish-eggs like those of the Herring can produce larvæ in such prodigious quantities as to form a carpet for a considerable bay, in the midst of similar enemies to those of the pelagic forms, it is perhaps somewhat premature to place too much weight on the supposed enormous losses in the pelagic types, especially in estimating the value of hatcheries for marine forms. Again, the statement† that it is probable that 12,000 adult Plaice, living under natural conditions, would be required for the production of

* First Lecture Roy. Instit. 1907, pp. 14 and 15, and including an allusion to the absence of any result of the artificial hatching after fifteen years' work by the Scottish Board.

† Report S. F. B. xxvi. part. iii. p. 45, 1908.

100,000,000 larvæ is somewhat fanciful. One of the strongest points made by Dr. Fulton is the comparative captures in July during each of the periods, that in which larval Plaice were introduced supplying more than double the number of the blank period. On the whole, while the experiment in Loch Fyne is most interesting, and does credit to those concerned, we are yet in want of more conclusive proof of the benefit of marine fish-hatcheries for the open sea.*

* Amongst those who spoke on the communication, Prof. Hubrecht, of Utrecht, expressed his pleasure at listening to the result of many years' work, and pointed out that Prof. Huxley had similar views as to the resources of the sea. Dr. C. J. Petersen, of Copenhagen, one of the International workers, hesitated to express an opinion at present, pending the conclusions of the North Sea Committee, whilst Prof. Ewart emphasized the erroneous ideas of the fishing population as to pelagic eggs in the eighties of last century.

THE FULMAR: ITS PAST AND PRESENT STATUS IN THE NORTH ATLANTIC AND IN THE NORTHERN PARTS OF EUROPE AND NORTH AMERICA, AND SOME ACCOUNT OF ITS GREAT INCREASE IN GREAT BRITAIN.

By J. A. Harvie-Brown.

Introductory Remarks.

Before speaking directly to the subject of this paper, under its full heading, we desire to set at rest, if that be possible, some very old and serious misconceptions and errors which have had some effect upon not unimportant statements in the life-history of the Fulmar.

Much as we—and all who go down to the sea in ships—must feel indebted to Captains Thomas and Otter for their admirable surveys of the seas and isles, stacks and skerries, of the West Coast of Scotland, there still remain uncharted many sunken reefs and unnamed dangers. And besides, there are the names of certain others which have handed down confusion even to the very present time, this confusion becoming even worse confounded with almost every repetition or requotation. But the same causes of confusion which still exist to-day—as we hope finally to show—are those self-same causes of the original confusion dating back—in at least one case—as long as 1746, and how much longer we cannot now say.

The first we speak of may not have been caused by quite such ancient misapprehension, and the results may not have developed such important consequences, but it does apply directly to the subject of our particular study—"The Fulmar and its Status, &c." Captains Thomas and Otter *did* distinguish in this instance, and any confusion since ought not to be laid to their charge. The islands we speak of are North Ronay and North Barray (the latter likewise correctly termed *Sulisgeir*).

North Rona or Ronay is confused (by strangers to the isles) with three other islands of the same name, Rona or Ronay. There are in all four isles, or groups of islets, which bear the names of Rona, *e. g.* North Ronay, situate north-east of the Butt of Lewis, and north-west of Cape Wrath, and forming the apex or north point of an equilateral triangle, having for its base a line drawn between the Butt of Lewis and Cape Wrath. Closely associated with it is North Barray or *Sulisgeir* (i. e. if sixteen miles by sea be considered association, and of which we have more to say in the later part of this paper). Then we have South Ronay, which is synonymous with Ronin, or the Island of Rum, and East Ronay, which lies close to and immediately to the north of the Island of Raasay (*sic*), between Skye and the Mainland. And, lastly—so far as we are here concerned—we have West Ronay, an island lying close to and at the south-east extremity of the Island of North Uist.

The error which originally appeared, however, whilst affecting these positions in an indirect sense, or complicating the issues, really was more clearly caused by a confusion of the positions of several islands and islets of the name of Barra, Bara, or Barray. Shortly stated, these are North Barray (or Sulisgeir), already mentioned, and "the South Isles of Barra," at the southern extremity of the Outer Isles, and which include Barray, Mingulay (*sic*), Muldonich, Vatersay, Pabbay, Barra Head or Berneray, and other smaller rocks, islets, stacks, and skerries. North Barray and the Isles of South Barra are some one hundred and sixty-five miles apart.

Atkinson appears to have been the first person to have stated that Fulmars nested not only on St. Kilda, but also "*on the Isles of South Barra.*"*

This, in part at least, but somewhat indefinitely, was quoted by John Wolley. He evidently intended to correct Atkinson's statement, and says: "It is, however, said to breed in the Island of Barra—*perhaps not South Barra*—and on Rona" (the italics are those of the present writer). But Wolley, in his statement explanatory, introduces a further trouble by speaking of Rona and "Sulisgeir" (or North Barra) as two rocks lying "far to the north

* *Vide* 'Transactions of the Nat. Hist. Soc. of Northumberland, Durham, and Newcastle-on-Tyne,' vol. (or part ?) ii. p. 222 (1832).

of Cape Wrath."* Truly speaking, these lie *north-west* of Cape Wrath, and north-east of the Butt of Lewis, and with these angles of an equilateral triangle form the apex to the north, as already shown under the notes on Ronay.

Thus, as will be seen, and as I hope finally to prove, confusion again became repeated (*i. e.* repeated from Charts and Books of Directions of the Admiralty, carried down and still increased in confusion to December, 1910), as I will show later on.

Again, Mr. Robert Gray, writing on and referring to previous statements without authorities, still further complicates the matter by saying: "But [the Fulmar] has now entirely abandoned that locality—*i. e.* the Isles of South Barray—none having been seen there in the breeding season since 1844." Mr. R. Gray gives no authority for the original statement—not even Mr. Atkinson; a very considerable confusion also being quite apparent in several people's minds as between Fulmars and Manx Shearwaters. It is many years since that confusion was cleared up as regards stated nesting-places of the Fulmar in Skye, in Mull, and—by native spokesmen—"in many places in Skye," besides the one specified to Gray by Cameron, of Glen Bhreatal.† And it seems almost unnecessary to repeat here that the evidence quoted by Mr. Gray, on the authority of "the light-house-keeper at Barra Head" some years previous to said information (*op. cit.* under Shearwater, p. 503), is quite too vague and confused to warrant any belief in the Fulmar ever having nested at Barra Head, and certainly not within the memory of any man then alive. Here the confusion is not in the names of places, but in the identities of the two species. It seems to me to be evident, from Mr. Gray's statements, that he simply desired to express the one fact that, "so far as his knowledge of these Hebridean Isles was within his own grasp, no Fulmars had been seen at Barra Head in the breeding season since 1844," but he does not affirm *on his own account* that they *did* breed there *before that date*, nor does he quote Atkinson, and

* "*Far to the north of Cape Wrath*" might lead to the supposition by the unwary reader that the Stack and Skerry Rocks, erroneously called also *Suliskerry*, were intended as so situated, *i. e.* the two groups having changed places! J. Wolley: "Observations on the Ornithology of the Faroe Isles" [(*sic*) Col. H. W. Feilden corrects this, however, to "*The* Faroes"] in 'Contributions to Ornithology' (1850).

† 'Birds of the West of Scotland,' pp. 449–500.

only speaks of the "lighthouse-keeper" under Shearwater.* Of the much later actual residency at Barra Head we speak later on in its proper chronology.

St. Kilda we hold alone of all these Hebride Isles was the home, in British seas, of the Fulmar Petrel in the nesting season.

We now come to speak of the still greater confusion which has lasted—as, I hope, finally and once for all to prove—at least from some time previous to 1746, which is the date of Rev. Geo. Low's MSS. Notes.† This confusion applies to the names carelessly spoken, carelessly applied, and confounded down to the present time, and still more confused even as late as Dec. 31st, 1910, the date of the latest issue of the 'Chart Index of the Hydrographical Department.'‡

We first take Rev. Geo. Low's MSS., where there occurs a very pointed and significant passage as follows—and as it is in all probability matter fresh to most of our readers, and of considerable interest besides to naturalists, I give it in full and literally transcribed :—

"About ten leagues W.N.W. from Hoy lies Soul-Skerry (more properly Seal-Skerry),§ a small islet, omitted by all the writers I have had an opportunity of seeing; it is said to be about a mile and a half in circumference; it hath only one landing place for boats, and in the middle of the island is a small lake. For some years past the people of Stromness have gone in the months of October and November to this island for Seals, which lie here in thousands amongst the luxuriant herbage. There is always a number of men upon this expedition,

* There would almost appear to be a fixed determination to keep these errors afloat, and to despise the correct place-names. Thus, and at this eleventh hour, we find the confusing repetition: "The most southerly breeding-place in the British Isles is Barra" (*cf.* 'British Birds' (Maga), July, 1911), and, as if one error was not enough at a time, that *Maga* supplements the above by a second, *viz.* that "the only other nesting haunt on the mainland being Cape Wrath, Sutherland, which was first discovered to be the resort of these birds in 1901"; and this is perpetuated by 'Nature' of August 10th, p. 200. The correct statement is: "The most southerly breeding-place in the British Isles is Barra-*Head*, two hundred and sixty-five miles south of Barray" = North Barray or Sulisgeir. They have not been correctly quoted as nesting at Cape Wrath, but they do so at Clomore cliffs. They have also been recorded as nesting in Caithness, at Dunnet Head (see *infra*, part iii.).

† 1778 being the date of his printed account; see *infra*.

‡ Whereupon Stack-and-Skerry are named "Sule Skerry" and "Stack Skerry," again making confusion.

§ *i. e.* "more properly Seal's Skerry."—J. A. H.-B.

and whenever they land (which they do quietly in the grey of the morning) they immediately surround the island to prevent the Seals getting into the sea upon the alarm : and each having a strong batoon (*sic*) knocks the Seals on the head and fells them as they attemp (*sic*) the sea ; in this manner they go round and round the Isle, always describing less and less circles until they reach the centre, where they find the harassed Seals swiming (*sic*) in great numbers in the above Loch (*sic*), which they likewise kill, for the loch will not take a man above the haunch. I have been told that in two or three hours they will kill four or five hundred Seals. As soon as they are done killing, they take off the Fat with the Skin, which they separate from it after they return home ; for they must not delay to do it there, for if a storm should arise they would not get off to the ship which lies at an anchor about half a mile from the isle. It appears somewhat strange that tho' they leave such a number of carcases in the island, that when they return next year they will not even find so much as a Bone. From this it seems probable that the living Seals carry off their bodies into the sea, for suppose them to eat the flesh, which is contrary to nature, what do they make of the Bones ?

" They never go to *Seal-skerry* (*sic*), but in a S.E. or an East wind, for when the wind is from any other point the sea is so rough that they cannot land.

" This island till of late was the property of Mr. Graham, of Brackness, who had a Tack* (*sic*) of it from Lord Duffus : and in it there is the remains of a house built by one of the family of Brackness. There hatch in this isle and in a high rock near to it called The Stack (*sic*) a number of different Sea-fowls, particularly the *Pelicanus bassanus* Linnæi (Soland Goose)."†

That the above should have generally escaped observation

* *Tack* (Anglicé = *Lease*).

† 1778. Rev. Geo. Low, " Journal of a Tour thro' the North Iles, and part of the Mainland of Orkney, in 1778." This is the title given by Sir Arthur Mitchell in his ' List of Travels in Scotland,' and he has added a note as follows (*loc. cit.*) : " Manuscript in my possession. In the same volume there is a translation by Mr. Low of the parts of Torphæus which refer to Orkney." The above excerpt is from p. 21 of the original MSS. now in my hands, at Dunipace (J. A. H.-B.). The volume was Lot 740 of Dowell's Sale Catalogue of date December, 1911, and, with others, was purchased by me. The Gannet has never frequented the Skerry, and is confined to the Stack, or the *Stack off the Seal's Skerry*.—(J. A. H.-B.).

and registration before is scarcely to be wondered at, but it is worth while to give here also what Rev. Geo. Low actually published, the finished MS. of which is said to have disappeared :—

"The nearest land to Orkney where the Solan Goose breeds is a rock called the Stack of Soliskerry (*sic*), where many hundreds breed every year, *as the Seals do on the Skerry*"; and then he relates how "some time ago a ship . . . brought back a great quantity of Solans," and so forth.*

We have given the above excerpt and the references for the reason already mentioned, and also because we think it should for ever set at rest the past and present confusion that exists.

I do not intend to go over ground I have frequently traversed before to try and impress the truth, though my doing so has rather partaken of the nature of a "voice crying in the wilderness." But I cannot pass by the latest added confusion given so lately as in the Index Chart C of the 'Catalogue of the Admiralty Charts,' dated 1911, and said to be corrected to date of December 31st, 1910.

I find here the misnomer (or error) repeated—"Sule-Skerry" (*sic*), and alongside it "Stack-Skerry" (*sic*). If anything, this makes confusion worse confounded yet once more. There would be no confusion if the joint name "Stack-and-Skerry" were adopted, as I have heard it used as long ago as 1863, when residing for some six or seven weeks in Joseph Dunn's house in Stromness. "Sule-Skerry" is a misnomer, because Gannets do not and never did frequent the Skerry, or ever willingly, I feel confident, ever place *flat feet* upon it. "Sule-Skerry" also, besides being a misnomer, is also merely a confusion of the colloquial expression, *The Seal's Skerry*, as I have heard it used by the sealers, who, equally with the Stromness men, or, it may well be, subsequent to their visits, went out in October or November from Tongue; of which parties my old friend, the late Mr. John Crawford, of Tongue (factor to the Duke of Sutherland), used to be one participant, and his two sons also went up to the date of about 1870 to 1872, and as I can well remember *they "never went to the Stack,"* or *Gannet Rock*.

Further, "Stack-Skerry" is a misnomer and an error as a place-name. That the Admiralty Office still remains in doubt

* 'Fauna Orcadensis,' &c., iv. p. 148.

is evident, because I find, in the General Index to the Catalogue of Publications, all three names given to North Barray, thus: "*Sula Sgeir*," *Sulesker*, and *North Barra* (*i. e.* near North Ronay), but there is no index reference whatever to "Suleskerry" (the misnomer), though, as I have shown above, *on the Index Chart* are "*Sule-Skerry*" and "*Stack-Skerry*"! More I cannot say, but, with all my previous experiences, I shall still wonder if I have said enough. I daresay, at least, my readers may think so, but I hope they will not blame me!*

Although the succeeding notes bear no direct reference to the subject of the Fulmar's distribution and dispersal, yet I cannot conclude this introductory part without once more calling attention to a still more important *neglect*, which I have also spoken of fully before, and that is as regards that most dangerous obstacle to safe navigation—the Helen's Reef—which is a submerged ridge forming a long shoulder of the great submerged mountain, of which Rockall forms the only visible top above water, which top is 72 ft. in height and 300 ft. in girth, as was pointed out by Captain Basil Hall in his 'Fragments of Travel'—an old statement that "the best account written regarding Rockall" was merely a fanciful picture by a person *who confessed to me in a letter* that he had never been at Rockall (*sic*). I have elsewhere quoted that communication fully, and need not repeat it

* Perhaps the following adaptation of a well-known piece of "poethry" may help to fix the fact in the memory:—

"'And now, me bhoy, hould up yer head,
And look like a gentleman, Sor;
And tell me where *Suleskerry* is;
You can tell me if you'll try, Sor':
'O there nivver wasn't no such place,
And it's all a bluidy loi, Sor.'

"'Right ye are, me bhoy . . . .
Now tell me where *Seal's Skerry is*?
Spake up like a gentleman, Sor!'
'O Skerries are simply lumps o' rock
Which were christened by Julius Cæsar,
They were carted acrass from Norroway
When there wasn't then no seas, Sor.'

"'Right agin, me bhoy, ...
Where did ye fetch yer knowlidge?'
'O just in the same place as yerself—
In my Mother's milk—and Porridge.'
'Perhaps, but of this I can't be sure,
In some Silly Skerry's College.'"

here.* It might have been well also if the gentleman who confessed so much had confessed to all, and that his whole essay to 'Chambers's Journal' was simply Captain Basil Hall's admirable account of that distant rock (*which* "*was* the best account written of Rockall"), or if not the same, not sufficiently disguised, and at the same time *betrayed* by his allusion to *Little Auks nesting* upon it. This, had such a phenomenon been in existence, would have thrown even the vast isolation of the St. Kilda colony of Fulmar Petrels far into the shade. And this brings us back again to St. Kilda, about which I desire to say just a few words here.

I may say at once I have utterly failed, after much searching vainly, to carry any history of the Fulmar in St. Kilda further back than Martin Martin's writing in 1703, *i. e.* some two hundred and fifty years. Behind and beyond that even tradition fails to provide a clue.

No writer that I have access to mentions the Fulmar as a native of St. Kilda prior to Martin's writing. Linnæus gives no sign of his knowledge of the colony, his statement regarding its general status simply being "*intra tropicum arcticum*."† I find nothing in Aldrovandus nor Ray, and I have failed to find any quotations from these writers or Gesner which indicate its presence there, except Brisson, a reference to which Linnæus gives.‡

Careful consideration of the Gaelic name of the bird and correspondence with authorities on Celtic languages force me to the conclusion that none other exists except the simple "*Fulmair*," as adopted from the English name, *Fulmar*. To arrive at this definite result has cost a lot of trouble: *done, it may save such again.*

We must, therefore, be content to believe the *oldest past* of the colonizing of St. Kilda by Fulmars is beyond our ken, and turn to its comparatively more recent existence as a British bird.§

* 'Annals of Scottish Natural History,' 1892, p. 197.

† 'Systema Naturæ,' 12th edit. p. 213, 1766. (We do not quote the 10th edit.)

‡ Quotes Brisson's account of a specimen sent to Paris.

§ Which portion of this paper, as already stated, has been contributed to the pages of the 'Scottish Naturalist,' commencing in May, 1912.

(To be continued.)

EMIGRATION THROUGH NORFOLK OF THE ROOK AND GREY CROW.

By J. H. Gurney, F.Z.S.

The spring emigration of the *Corvidæ* from our shores has long attracted attention in Norfolk, because it is always noticed. The reason for this is that the passage takes place almost entirely in the daytime, apparently not beginning until sunrise. These annual March flights of the Grey or Hooded Crow (*Corvus cornix*) and the Rook (*C. frugilegus*) were observed by, and their meaning well known to such careful men as the Rev. E. W. Dowell, W. R. Fisher, my father, and others in this county, nearly seventy years ago, and may have been detected long before that by other naturalists whose names are forgotten.

Regularly as March comes round does this striking passage of birds present itself. Sometimes it is so gradual as to attract little attention, sometimes there are days when continuous flocks are travelling overhead, in perfect silence, for hours at a time. Where do they all come from? There was a memorable passage in March, 1886, to which I think attention was drawn at the time (*cf.* 'Zoologist,' x. p. 391). From the 20th to the 29th of that month flocks of Rooks were constantly in view, and the number which travelled through Norfolk, along the coast, more particularly between Cromer and Lowestoft, was enormous—all apparently going in a south-east or southerly direction. Rooks and Grey Crows do not often mingle in the same flock, though both may be visible in the air at the same time, but a company of Rooks frequently has an admixture of Jackdaws in it. Carrion-Crows and Ravens have also been reported on the Norfolk coast, but I have never identified either in the neighbourhood of Cromer.

The height at which these emigrating Crows and Rooks and Jackdaws generally fly, when preparing to quit the coast of Norfolk, is from two to three hundred yards, but at the same

period of the year (spring) Rooks pass over the little island of Heligoland at a much greater altitude than this, according to Gätke. They must therefore mount after leaving Norfolk, and it is probably done gradually. Often, he says, only their calls, faintly audible from above, give indication that they are speeding on their way above the range of human vision (*cf.* "Birds of Heligoland," p. 207). When I was in Heligoland in 1883 I had the chance of conversing with the veteran observer about migration, a subject on which he knew more than any man living. Gätke has a great deal to tell his readers in his admirable book about the Grey Crow and the Rook—witness the many references to the former in the index. He tells us that the number of Grey Crows which pass that island of the North Sea in spring is scarcely half of what pass it in autumn. This he accounts for by supposing that most of them take a shorter route on their return journey (T. C. p. 43), but I think it likely that wind has something to do with it, and one must make allowance for a considerable annual waste of life, which in all probability takes place.

During the present spring (1912) the exodus has been observed as usual on the coast of Norfolk, where it commenced early this year. The following are some notes made by an observer who is situated about a mile from the sea:—

February 21st.—Grey Crows, Rooks, and Jackdaws, passing over Northrepps in a south-easterly direction—the wind being light from the west—from 7.45 a.m. to 11.30 a.m.

23rd.—More Grey Crows flying in the same direction. Wind the same.

24th.—More Grey Crows, Rooks, and Jackdaws, passing over. No wind.

March 18th.—Grey Crows passing over Northrepps and Overstrand from 6.25 a.m. to 2.15 p.m. A gentle wind from the south.

19th.—Grey Crows passing over from 6.20 a.m. to 12.30 p.m. Hardly any wind.

Having enquired of Mr. Hugo Weigold, who carries on Gätke's work, how these dates fitted in with his observations made at the Biological Institute at Heligoland, he replied as follows:—

On February 21st only four Grey Crows were detected, but on the 22nd one hundred and twenty passed Heligoland, and on the 23rd about three hundred. On March 18th only six Grey Crows and some dozens of Rooks, on the 19th one Crow, and on the 20th none at all. The correspondence in migration during the spring of 1912 was therefore not great.*

In his recently published and most useful 'Studies in Bird Migration,' Mr. W. E. Clarke has some excellent remarks on the *Corvidæ* (especially in chap. xvi.), with valuable comments on the movements of the Grey Crow and the Rook in spring. Mr. Clarke has cited three instances in chap. xv. of Rooks and Starlings *arriving on the Norfolk and Suffolk coasts in spring* (*cf.* vol. i. p. 263, note), which is contrary to what one looks for at that time of the year, when they are generally going the other way.

One of the cases which Mr. Clarke quotes is a note of mine in 'The Zoologist' (1902, p. 87), referring to eight dead Rooks and some Starlings which were found by Mr. A. Patterson on the shore near Yarmouth on March 23rd, 1901. But this communication, being badly expressed, has evidently been misread. The meaning intended, which is not very clear, I must admit, was not that these birds had been drowned on their migration to England, but during their usual vernal passage from our coast to the Continent, and their bodies afterwards washed back by a gale from the east. It appears that a similar disaster nearly happened off Yarmouth to the Rooks in 1904 when on their customary spring voyage from this country.

On February 22nd of that year Mr. A. Patterson, of Yarmouth, saw hundreds of what he terms "wind-muddled Rooks," trooping in from the North Sea, which had evidently found the north-west wind, then blowing half a gale, too strong for a continuance of their journey (*cf.* 'Nature in Eastern Norfolk,' p. 148). In this case it seems that most of them put back to land in time to save their lives, but for aught Mr. Patterson knew many may have been drowned.

Mr. Clarke is of opinion that considerable numbers of Rooks

* On this subject a table of comparisons, extending over many years' which included many species, was published in the Norfolk Naturalists' 'Transactions' (vol. iv. p. 52).

do arrive in the spring "on the south-east of England, between Kent and Norfolk," having come, I suppose, from Belgium or North-east France. If this is so, they may occasionally meet the bands leaving Norfolk by a south-easterly route at the same time of the year, but a wind which suited one party would be more or less adverse to the other, so it is not likely that they often clash.

Mr. Eagle Clarke's two volumes form an important work, on which great pains have been bestowed, and one which cannot fail to considerably advance the interesting but perplexing study of migration. Chap. viii. contains matter of much value on "Weather Influences" on the birds, particularly as bearing on the spring emigratory movement from the British Isles.

Mr. Clarke considers increase of temperature to be the main influencing factor with birds, and most observers will agree with him here, but he does not attach quite so much importance to the direction of the wind as I should have expected.

Whoever studies either emigration or immigration of birds on the rounded and projecting coast of Norfolk must take the direction of wind into account; of that, after watching their movements for thirteen years in the neighbourhood of Cromer, I feel convinced. However, the position of our county is peculiar, for there is no other part of the East Coast which projects so much into the North Sea until Banff, in Scotland, is reached, and the wind may have more effect in Norfolk than elsewhere.

NOTES AND QUERIES.

AVES.

Starlings on Sheep's Back. — I have the following note, dated Sept. 23rd, 1903 :—"Saw Starlings in a field of fairly long grass. They frequently rose from the grass, in which they could not be seen, to perch on the back of sheep. They apparently used the latter as a look-out, and occasionally pecked something off it. They walked with care on the wool, and did not mind the sheep being in motion."—F. B. KIRKMAN (Letchworth).

Additional Notes on the Domestic Habits of Corvus corone. — In transcribing my field notes on the domestic habits of the Carrion-Crow, which appeared in 'The Zoologist' (*ante*, p. 321), I inadvertently omitted a series relating to another pair, making the third which I watched. From these I now select three which have a definite value.

April 9th, 1910.—I forgot, in my entry of the 7th, to mention the curious intonation of the note of one of these Crows quite near me, though I could not see it through the white morning mist which enshrouded everything. It was not the harsh "arrr, arrr, arrr" any more, but a quite different sounding, "oh, oh, oh," something resembling the human voice (or a less aggravated variety of it), but also with a suspicion of the sound made in uncorking a bottle of wine, or by imitating that sound with the finger and thumb, like the Capercailzie's "kunststück," but far less pronounced. I cannot describe the note any better, and this does very little. This morning, between 6 and 7, I saw the bird, uttering this peculiar note, quite near. It threw up its head, each time, in the usual way, pronouncing it three times, and, its back being turned to me, I noticed how broadly the tail was, each time, fanned out. Is this note the so-called "song" of the male? for the ordinary one is uttered, I believe, by both sexes upon ordinary occasions, and with the same action.

May 1st.—Got to the place at 4.30 a.m., and as I cycled by saw the one Crow sitting by the nest, and the other in it—for it was lighter than I had thought it would be at this time. The perched Crow did not appear to notice me, any more than on the other morning.

He seemed asleep, but flew out, once, from the coppice, and back again, just as I was getting into position. I now watched the nest closely (from a cavity in a thick gorse-hedge, where, and from the side on which I entered, I was quite invisible), and just at 5 the sitting bird flew off it. There was no change upon or visit to the nest, the other bird having flown down on to the ground a little while before. On leaving the nest the Crow flew to a tree not far off, and sat there, preening herself and stretching her wings. She then flew down to the ground, where I lost her, as I have the other, and at 5.15 one of the pair, probably she, flew into the coppice, and, having chased some small birds from the nest, sat in a tree near it. At 5.35 she flies away, and soon after this I leave.

2nd.—Got into position by 4 a.m. It was too dark for me to distinguish anything but the black mass of the nest as I passed the coppice, and even this was invisible from my place of concealment till I had sat there for some little while. Gradually I saw both it and the partner bird perched in the adjoining tree. At 4.40 the latter flew, a little, out of the coppice into a tree quite near, and in the same line with it—much as yesterday. At 5 he flew from here, and I lost sight of him, nor did he reappear whilst I stayed. At 5.15 the sitting bird flew from the nest without any apparent getting ready to do so—directly off the eggs, as it seemed. I stayed long enough to make it quite certain that this exit of the sitting bird had nothing to do with the coming up of the other to take its place. The latter did not reappear, and it must have been quite half-past five when I walked into the coppice and struck the quite small birch tree several clanging blows with my walking-stick camp-stool, thus reinforcing (for no bird flew out) the verdict of my eyes.

If all the details of the above two extracts be studied, it will be seen that it would be violently straining all probability to suppose that a change had taken place upon the nest *before* 5 a.m. and 5.15 a.m. respectively. In Kirkman's 'The British Bird Book' it is stated,* in regard to the Carrion-Crow, that "both sexes incubate." No reference being given, or further comment made, there seems room for a little evidence on the subject, and I herewith contribute my quota. It affirms (within its limits) that there is no change upon the nest between the two sexes of Crow, and that after the nest has been left by the incubating bird it remains empty, generally under such circumstances as make it apparent that the going off of the latter has not stood in any relation to the coming up, to incubate, of its mate,

* Section I. p. 3.

whilst nothing points in the contrary direction. If it is contended that, for all this, the two sexes do incubate, actual affirmative evidence in favour of this contention should be adduced. Brehm, I believe, was of an opposite opinion.

Both Crows and Magpies are abundant in France, and I should like here to say (as a matter of justice as well as of field natural history) that, though my observations were extended through the whole spring and early summer, they furnished little or no evidence that either of them spent much time in searching for the nests of small birds, and, moreover, the quickness with which in a country where one can go anywhere they disappeared through the intervention of trees, copses, &c., the difficulty of holding them in chase, or of keeping any bird, not more or less stationary, or not in the open, in view for any length of time, convinced me that mere general assertions to this effect ought to be received with great caution, or rather, should not be attended to. Crows and Magpies, whenever I saw them—and I was always seeing them—were not occupied with, nor did they appear to be thinking about, small birds or their nests, but they constantly patrolled the land, looking about for anything they could find upon it. Adding to the time thus spent, that which was socially, domestically, or quiescently occupied, little appeared to me to be left over for those organized tree-to-tree or bush-to-bush birdsnesting hunts, which in books are so frequent, but which I never once clearly saw; nests, of course, are not the only things in trees. One thing was very evident, *viz.* that the laws of Nature, without man's disturbing influence, allowed of an abundance of Crows and Magpies (as also of Jays), and at the same time, likewise, of an abundance of small birds. I also came to the conclusion that from the point of view of the peasant proprietor (who gave no visible sign of hostility) neither of these species was a pest or a nuisance, and a naturalized English farmer corroborated this, and stated that the French Government had at one time thought of thinning the number of Magpies, but abandoned the idea, as they could not find out that they did any harm. My informant had no quarrel with them, and told me he loved the birds. Of course, with the substitution of landlordism and the game laws for peasant proprietorship all this would be altered. With an artificial abundance of large ground-laying birds, a relish for their eggs and, to some extent, their young must be acquired, and two species which, together, add enormously both to the homely charm and gay adornment of the countryside, would become pests to pests, and a nuisance to what is a nuisance. And,

as the concomitants of this, we should have all that usual crop of weeds which lies, ever in wait, to spring up and choke any wild bird's life—hasty conclusions and ignorant prepossessions, undue assurance in regard to the evil complained of, credulous hatred, and an itch to find ropes to hang dogs with. As to the supposed evil, Ravens are abundant in Iceland, and prey, when they can, on the eggs and young of good-sized birds that make their nests on the ground. But these latter are abundant in a still greater degree—indeed, they may be more numerous, on the whole, though less crowded, than Pheasants and Partridges with us. Would they become less so if they counted as game, and were the Ravens declared vermin and pests?—Edmund Selous.

Black-tailed Godwits visiting Cork Harbour, Co. Waterford.—These birds have this season visited their old haunt in Cork Harbour, the Blackrock mudbanks, and one bird was shot about the middle of September. They appear for some years past to have visited this haunt pretty regularly. They have also visited County Waterford, where, on Sept. 21st, Mr. R. Ussher, of Cappagh House, on the Shandon Estuary, saw some, where last season he shot a pair. It is interesting to note these birds revisiting their old haunts.—Robert Warren (Ardnaree, Monkstown, Co. Cork).

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, DUNDEE, 1912.

ADDRESS TO THE ZOOLOGICAL SECTION.

By P. Chalmers Mitchell, D.Sc., F.R.S., *President of the Section.*

Zoological Gardens and the Preservation of Fauna.

(Continued from p. 360.)

The conditions in Africa are very different from those in India. The land is portioned out amongst many Powers. The settled population is much less dense, and the hold of the white settler and the white ruler is much less complete. The possibility of effective control of native hunters and of European travellers and sportsmen is much smaller, and as there are fewer sources of revenue, the temptation to exploit the game for the immediate development of the struggling colonies is much greater. Still, the lesson of the extinction of the South African fauna is being taken to heart. I have had the opportunity of going through the regulations made for the shooting of wild animals in Africa by this country, by our autonomic colonies, by

France, Germany, Italy, Portugal, and Belgium, and, with the limitation that they are directed almost solely towards the protection of animals that can be regarded as game, they afford great promise for the future. But this limitation is still stamped upon them, and even so enthusiastic a naturalist as Major Stevenson-Hamilton, the Warden of the Transvaal Government Game Reserves, who has advocated the substitution of the camera for the rifle, appears to be of the opinion that the platform of the Convention of 1900 is sufficient. It included the sparing of females and immature animals, the establishment of close seasons and game sanctuaries, the absolute protection of rare species, restrictions on the export for trading purposes of skins, horns, and tusks, and the prohibition of pits, snares, and game traps. Certainly the rulers of Africa are seeing to the establishment of game reserves. As for British Africa, there are two in Somaliland, two in the Sudan, two in Uganda, and two in British East Africa (with separate reserves for eland, rhinoceros, and hippopotamus), two in Nyasaland, three in the Transvaal, seven in Rhodesia, several in Natal and in Cape Colony, and at least four in Nigeria. These are now administered by competent officials, who in addition are usually the executive officers of the game laws outside the reserved territory. Here again, however, the preservation of game animals and of other animals of economic value, and of a few named species is the fundamental idea. In 1909 I had the honour of being a member of a deputation to the Secretary of State for the Colonies, arranged by the Society for the Preservation of the Wild Fauna of the Empire, one of the most active and successful bodies engaged in arousing public opinion on the subject. Among the questions on which we were approaching Lord Crewe was that of changes in the locality of reserves. Sometimes it had happened that for the convenience of settlers, or because of railway extension, or for some other reason, proposals were made to open or clear the whole or part of a reserve. When I suggested that the substitution of one piece of ground for another, even of equivalent area, might be satisfactory from the point of view of the preservation of large animals, but was not satisfactory from the zoological point of view, that in fact pieces of primeval land and primeval forest contained many small animals of different kinds which would be exterminated once and for all when the land was brought under cultivation, the point was obviously new not only to the Colonial Secretary, who very courteously noted it, but to my colleagues.

This brings me to the general conclusion to which I wish to direct your attention, and for which I hope to engage your sympathy. We may safely leave the preservation of game animals, or rare species if these are well known and interesting, and of animals of economic value, to the awakened responsibility and the practical sense of the Governing Powers, stimulated as these are by the enthusiasm of special Societies. Game laws, reserves where game may recuperate, close seasons, occasional prohibition and the real supervision of licence holders are all doing their work effectively. But there remains something else to do, something which I think should

interest zoologists particularly, and on which we should lead opinion. There exist in all the great continents large tracts almost empty of resident population, which still contain vegetation almost undisturbed by the ravages of man, and which still harbour a multitude of small animals, and could afford space for the larger and better-known animals. These tracts have not yet been brought under cultivation, and are rarely traversed except by the sportsman, the explorer, and the prospector. On these there should be established, in all the characteristic faunistic areas, reservations which should not be merely temporary recuperating grounds for harassed game, but absolute sanctuaries. Under no condition should they be open to the sportsman. No gun should be fired, no animal slaughtered or captured save by the direct authority of the wardens of the sanctuaries, and for the direct advantage of the denizens of the sanctuaries, for the removal of noxious individuals, the controlling of species that were increasing beyond reason, the extirpation of diseased or unhealthy animals. The obvious examples are not the game reserves of the Old World, but the National Parks of the New World and of Australasia. In the United States, for instance, there are now the Yellowstone National Park with over two million acres, the Yosemite in California with nearly a million acres, the Grand Cañon Game Preserve with two million acres, the Mount Olympus National Monument in Washington with over half a million acres, and the Superior Game and Forest Preserve with nearly a million acres, as well as a number of smaller reserves for special purposes, and a chain of coastal areas all round the shores for the preservation of birds. In Canada, in Alberta, there are the Rocky Mountains Park, the Yoho Park, Glacier Park, and Jasper Park, together extending to over nine million acres, whilst in British Columbia there are smaller sanctuaries. These, so far as laws can make them, are inalienable and inviolable sanctuaries for wild animals. We ought to have similar sanctuaries in every country of the world, national parks secured for all time against all the changes and chances of the nations by international agreement. In the older and more settled countries the areas selected unfortunately must be determined by various considerations, of which faunistic value cannot be the most important. But certainly in Africa, and in large parts of Asia, it would still be possible that they should be selected in the first place for their faunistic value. The scheme for them should be drawn up by an international commission of experts in the geographical distribution of animals, and the winter and summer haunts of migratory birds should be taken into consideration. It is for zoologists to lead the way, by laying down what is required to preserve for all time the most representative and most complete series of surviving species without any reference to the extrinsic value of the animals. And it then will be the duty of the nations, jointly and severally, to arrange that the requirements laid down by the experts shall be complied with.

(To be continued.)

NOTICES OF NEW BOOKS.

Wild Life in the West Highlands. By Charles Henry Alston. Glasgow: James Maclehose & Sons.

This volume consists of a number of essays on natural history subjects, in which personal observation is combined with an up-to-date knowledge of the writings of most of our best authorities. This opinion implies that the book cannot be listed with those many publications which are usually described as "nature books." Some, at least, of these essays have appeared elsewhere, as obligations are acknowledged to "the editor of the *Scotsman* for his kindness in permitting me to reprint such of these papers as appeared originally in its columns."

The chapters on "The Recent Increase and Dispersal of some Birds in Scotland" and on "Birds and their Changing Habits" are worthy of close attention. The discussion on "What is a Ferox" disposes of the claim of *Salmo ferox* to be considered as a distinct species, and concludes with the assertion that "in Great Britain and Ireland we have, in all its varied forms, but one species of fresh-water trout, *Salmo fario*." Anglers will find a judicious consideration *pro* and *con* of the colour-sense in fishes particularly applicable to the problem of angler's artificial flies. Do fishes perceive the differences of colour, and do those colours produce the same effect on the fish's as upon the human eye? There is very much to be said on both sides, and the question is still *sub judice*; but this may be affirmed, that when fish are fully on the feed—a circumstance none too frequent in the experience of the ordinary angler—the colour of the fly, or, with coarse fish, the colour or nature of the bait, seem to be a secondary consideration. The *scientific angler* is often a misunderstood term; the practical or observing angler has usually the fuller basket. This volume is not for stern biological study, but for the pleasant perusal of the naturalist and sportsman.

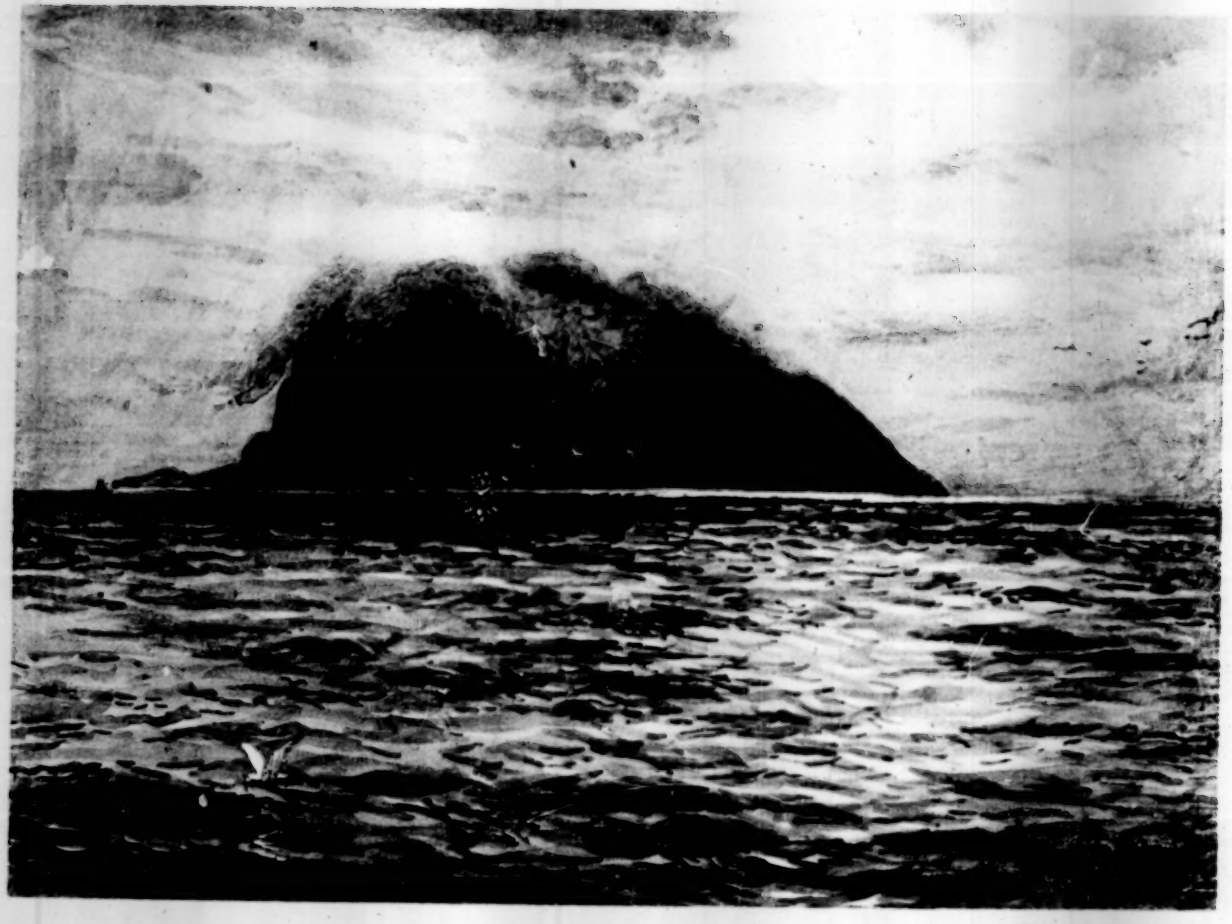
The Arctic Prairies; a Canoe-Journey of 2,000 Miles in Search of the Caribou, &c. By Ernest Thompson Seton. Constable & Co., Ltd.

Mr. Seton has written a lively account of a hard journey in a dismal land—the realm of the Hudson Bay Company. The book is very fully and well illustrated, but these artistic embellishments only more accentuate on the mind of the reader the impression of a barren and lonely region.

The animal life of this area is subject to vicissitudes. Sudden rises of the water after the ice has formed, or a dry season followed by severe frost, are sinister agents in the promotion of a high death-rate. In 1900, Mr. Seton was assured that along the Mackenzie "one could shoot 20 Muskrats in an hour after sundown. Next winter the flood followed the frost, and the Rats seemed to have been wiped out." In 1907, Mr. Seton spent "six months outdoors in the region, and saw only 17 Muskrats the whole time; in 1901 the H. B. Co. exported over 1½ millions; in 1907, 407,472. The fact that they totalled as high was due, no doubt, to their abundance in eastern regions not affected by the disaster." As the author remarks, "there is only one continuous statistical record of the abundance of animals, that is the returns of the fur trade," and he secured the Company's returns for the eighty-five years, 1821–1905 inclusive. The analysis of these returns is, zoologically, perhaps the most valuable element in the volume. The expedition seems to have been a successful one, though the wreck of a canoe almost caused the loss of "three precious journals; 600 pages of observation and discovery, geographical, botanical, and zoological, 500 drawings," &c. That this catastrophe did not ensue is a matter of scientific and personal congratulation. There are appendices, both botanical and zoological, and though a large part of these have appeared elsewhere, their absence from this volume would have been deplorable.

West, Newman collo.

HOLM OF MYGGANAES, FAROE.



MYGGANAES, FAROE. West, Newman collo.